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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/575,916	12/22/2006	Rodger Fehlhaber	10808/322 (In1341WOUS)	5269
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EXAMINER LUKE, DANIEL M				
ART UNIT		PAPER NUMBER		
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/575,916

Applicant(s)

FEHLHABER ET AL.

Examiner

DANIEL LUKE

Art Unit

2813

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 May 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 19-39 is/are pending in the application.
- 4a) Of the above claim(s) 30-33 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 19-24, 27, 29, 34 and 35 is/are rejected.
- 7) ☒ Claim(s) 25, 26, 28 and 36-39 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 April 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 4/14/2006
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

This office action is in response to the election filed 5/20/2009. Currently, claims 19-39 are pending. Claims 30-33 have been withdrawn from consideration.

Election/Restrictions

Applicant's election with traverse of claims 19-29 and 34-39 in the reply filed on 5/20/2009 is acknowledged. Applicant requested withdrawal of the restriction and election requirements, but did not address any reasons for such a traversal.

The requirement is still deemed proper and is therefore made FINAL.

Priority

Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d).

Information Disclosure Statement

The information disclosure statement (IDS) submitted on 4/14/2006 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the step of “producing at least one further cutout” (claim 19, line 13) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

Arrangement of the Specification

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

- (a) TITLE OF THE INVENTION.
- (b) CROSS-REFERENCE TO RELATED APPLICATIONS.
- (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
- (d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT.
- (e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC.
- (f) BACKGROUND OF THE INVENTION.
 - (1) Field of the Invention.
 - (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
- (g) BRIEF SUMMARY OF THE INVENTION.
- (h) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
- (i) DETAILED DESCRIPTION OF THE INVENTION.
- (j) CLAIM OR CLAIMS (commencing on a separate sheet).
- (k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
- (l) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

Currently, the specification is missing section headings.

Further, the disclosure is objected to because of the following informalities: "62" is used as a reference character for both a gate electrode layer and an insulating layer (see page 14, line 6 and page 15, lines 16-17, respectively).

Appropriate correction is required.

Claim Objections

Claim 19 is objected to because it is unclear how the filling material is used to pattern the carrier material (see claim 19, line 12). Amending to make it clear that the filling material is used as a mask would overcome this objection.

Claim 23 is objected to for its lack of clarity. In line 2, it is unclear if “a carrier material” is the same as the carrier material of claim 19. Further, the limitation of “patterning a base material using the mask layer after patterning the carrier material” is unclear, since it appears that the mask layer and the carrier material are the same, as defined in line 2 of claim 23.

Claim 25 recites the limitation “the expanded cutout” in line 2. There is insufficient antecedent basis for this limitation in the claim. The limitation should read “the modified cutout” to be consistent with the language of claim 19.

Claim 26 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 26 depends on claim 25, which depends on claim 19. Thus, “forming at least one layer compris[ing] the method of claim 19” does not further limit claim 25.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(c) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 19-24, 27 and 34 are rejected under 35 U.S.C. 102(e) as being anticipated by Beintner et al. (US 2005/0121412).

Pertaining to claim 19, Beintner shows, while referencing FIG. 6-8 and 10B-C, a patterning method, comprising: applying an auxiliary layer (54) to a carrier material (50); applying a mask layer to the auxiliary layer prior to a production of a cutout ([0065], [0042]); patterning the mask layer with a lithographic method ([0042]; [0013]); patterning the auxiliary layer (54) and the carrier material (50) with the production of the cutout (110) in accordance with the cutout (shown in FIG. 6); modifying the cutout in a region of the auxiliary layer (54) by isotropic etch-back ([0066], [0046]), where the cutout in a region of the carrier material (50) is not modified or not modified to an extent of the region of the auxiliary layer (shown in FIG. 7); filling the modified cutout with a filling material (180); removing the auxiliary layer (54) after filling (shown in FIG. 10C); patterning the carrier material using the filling material ([0070]; shown in FIG. 10C); and producing at least one further cutout (one of the two cutouts 110 shown in FIG. 6).

Pertaining to claim 20, Beintner shows the step of planarizing the filling material prior to patterning the carrier material ([0067]).

Pertaining to claims 20 and 21, Beintner shows a minimum feature size of less than 50 nm is produced ([0016]).

Pertaining to claim 23, Beintner shows the steps of forming a mask layer (52) as a carrier material prior to applying the auxiliary layer (54); and patterning a base material (50) using the mask layer (52) after patterning the carrier material (52) using the filling material (180). This is shown in FIG. 6 and 10C.

Pertaining to claim 24, Beintner shows a semiconductor material is used as the carrier material ([0065]).

Pertaining to claim 27, Beintner shows the steps of filling the cutout with a further filling material (for instance, the top portion of 180); and removing the filling material serving for patterning after the filling of the cutout ([0071]).

Pertaining to claim 34, Beintner shows modifying the cutout comprises expanding the cutout (shown in FIG. 7).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Beintner in view of Krivokapic et al. (US 6,762,483).

Beintner shows the method of claim 24, but fails to show the step of oxidizing the semiconductor material in the region between the cutout and the further cutout.

However, Krivokapic teaches in column 2, lines 11-14 that silicon fins are thermally oxidized. It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to oxidize the fins created by the method of Beintner (including the regions between the cutouts) with the motivation that the oxide can be removed to further narrow the width of the fins (column 2, lines 11-14).

Claim 35 is rejected under 35 U.S.C. 103(a) as being unpatentable over Beintner.

Beintner shows the method of claim 24, but fails to show that the semiconductor material is monocrystalline.

However, Beintner does show that the substrate is SOI ([0065]). It is well known in the art to use monocrystalline silicon as the upper layer of an SOI structure. Thus, it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to use monocrystalline silicon as the upper layer of the SOI structure of Beintner, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416 (CCPA 1960).

Allowable Subject Matter

Claims 25-26, 28 and 36-39 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Pertaining to claim 25, the prior art of record, either singularly or in combination, does not disclose or suggest the combination of limitations including forming at least one layer in the expanded cutout prior to filling.

Pertaining to claim 28, the prior art of record, either singularly or in combination, does not disclose or suggest the combination of limitations including partially removing the filling material from the cutout, where one part of a bottom of the cutout is uncovered and another part of a bottom of the cutout remains covered with filling material.

Pertaining to claim 36, the prior art of record, either singularly or in combination, does not disclose or suggest the combination of limitations including filling with an electrically insulating layer and an electrically conductive layer.

Pertaining to claim 37, the prior art of record, either singularly or in combination, does not disclose or suggest the combination of limitations including the region comprising an intermediate region extending from the cutout to the further cutout.

Pertaining to claim 38, the prior art of record, either singularly or in combination, does not disclose or suggest the combination of limitations including oxidizing prior to the removal of the filling material.

Pertaining to claim 39, the prior art of record, either singularly or in combination, does not disclose or suggest the combination of limitations including oxidizing after the production of an oxidation protective layer on at least one sidewall of the further cutout.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DANIEL LUKE whose telephone number is (571)270-1569. The examiner can normally be reached on Monday through Friday 8:30 a.m. to 5:00 p.m. EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matt Landau can be reached on (571) 272-1731. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/D. L./
Examiner, Art Unit 2813
7/29/2009

/Matthew C. Landau/
Supervisory Patent Examiner, Art Unit
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